

1    **WHAT IS CLAIMED IS:**

2           1. A back-up detecting device with a distance reset capability for a  
3   large vehicle with a chassis and a rear end, the back-up detecting device  
4   comprising:

5           a controller (10) having multiple inputs, multiple outputs, an intensity  
6   analysis program and a distance reset capability;

7           multiple signal conversion circuits (11) connected to inputs of the  
8   controller (10);

9           multiple ultrasonic transceivers (14) are mounted on the chassis  
10   underneath a vehicle (20) near the rear end (21), transmit ultrasonic sound  
11   waves, receive reflected sound waves, respectively have an output and are  
12   connected respectively to signal conversion circuits (11) through which the  
13   controller (10) controls the emission of ultrasonic pulses;

14          a reset button (12) connected to an input of the controller (10) and  
15   initiates the distance reset function when the button (12) is depressed;

16          a memory device (13) connected to the controller (10) and storing a  
17   distance pad  $D_0$ ; and

18          an alarm unit (15) connected to an output of the controller (10).

19          2. The back-up detecting device according to claim 1, wherein the  
20   alarm unit (15) has an alarm (151).

21          3. The back-up detecting device according to claim 1, wherein the  
22   alarm unit (15) has a monitor (152).

23          4. The back-up detecting device according to claim 1, wherein the  
24   alarm unit (15) has an alarm (151) and a monitor (152).

1           5. The back-up detecting device according to claim 1, wherein the  
2 distance reset function comprises the steps of:  
3           placing a solid block (30) vertically in front of a detector (14) flush  
4 with the rear end (21) of the vehicle (20);  
5           activating the range reset function by pressing the reset button (12);  
6           emitting ultrasonic pulses from the ultrasonic transceiver (14);  
7           receiving echoed ultrasonic pulses reflected from the solid block (30);  
8           calculating the distance to the solid block (30); and  
9           storing the distance to the solid block (30) in memory as the distance  
10 pad ( $D_o$ ).

11          6. The back-up detecting device according to claim 1, wherein the  
12 intensity analysis program comprises the steps of:  
13          emitting ultrasonic pulses from the ultrasonic transceiver (14);  
14          receiving echoed ultrasonic pulses echoed back from an object;  
15          calculating a distance  $D_x$  from the ultrasonic transceiver (14);  
16          retrieving a distance pad ( $D_o$ ) from memory (13); and  
17          applying the distance pad  $D_o$  to the measured distance  $D_x$  to obtain an  
18 actual distance  $D$  from the vehicle body to the object by subtracting the  
19 distance pad  $D_o$  from the measured value  $D_x$ .